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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/751,312	01/02/2004	Joschp J. Schottler	P06708US0-6025	2007

34082 7590 03/29/2007
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DES MOINES, IA 50309-2350

EXAMINER

CHANG, SUNRAY

ART UNIT	PAPER NUMBER
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2121

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/29/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)
	10/751,312	SCHOTTLER ET AL.
	Examiner Sunray Chang	Art Unit 2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 03 January 2007.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-10 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date: _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)	5) <input type="checkbox"/> Notice of Informal Patent Application
Paper No(s)/Mail Date: _____	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

1. This office action is in responsive to the paper filed on January 3rd, 2007.

Claims 1 – 10 are presented for examination.

Claims 1 – 10 are rejected.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. **Claims 1 – 4 and 7 – 10 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Joseph F. McCormick (U.S. Patent No. 5,012,722, and referred to as **McCormick** hereinafter), in view of Takano et al. (U.S. Patent No. 5,938,947, and referred to as **Takano** hereinafter) and further in view of John Laurence Melanson (U.S. Patent No. 6,727,832, and referred to as **Melanson** hereinafter).

(McCormick as set forth above generally discloses the basic inventions.)

Regarding independent claim 1, 8 and 9, McCormick teaches,

- A method of driving the coil of an electrohydraulic valve [Abstract, Fig. 3] with a PWM drive [Fig. 3], [see further Col. 5, Lines 14 – 27 & Col. 4, Lines 49 – 64] comprising:
- Transmitting a feedback signal to a digitizing device that is electrically connected to the electrohydraulic valve; [Col. 7, Lines 12 – 39, Fig. 8 applying the selected signal to ADC via analog line]
- Transmitting the plurality of samples to an accumulator; [loop controller receives control information indicating a desired operation of the hydraulic valve through control input, and feedback information indicating the state of various elements in the servo loop, Col. 5, Lines 16 – 20]
- Averaging the plurality of samples within the accumulator to create an average value; [operate in a desired manner, Fig. 2a – 2i, Col. 4, Lines 25 – 48, Col. 5, Lines 14 – 27] and
- Transmitting the average value to a closed loop control algorithm that generates a pulse width signal to drive the coil of the electrohydraulic valve. [formula relationships or look up data tables, Col. 7, Lines 47 – 61]

McCormick does not point out clearly the “operate in a desired manner” is using “averaging, calculating the samples”

Takano teaches “averaging, calculating the samples” [Takano, Col. 6, Line 22 – Col. 8, Line 38] for the purpose of detecting a reduction in the accurately with which the welding

current is detected, . . ., controlling the welding current with a predetermined degree of accuracy even when a reduction is detected. [Col. 2, Lines 57 – 63]

Melanson teaches a digital to analog converter; at least one pulse width modulator stage for generating from the noise-shaped data stream a pulse width encoded data stream at a second frequency of a selected multiple of the first frequency; output circuitry for converting the pulse width encoded data stream into an analog signal comprising: a finite impulse response filter for filtering the pulse width encoded data stream at a frequency greater than or equal to the second frequency; and a plurality of digital to analog conversion elements coupled to selected taps of the finite impulse response filter for generating an output analog signal, [Col. 10, lines 17 – 31] for the purpose of converting the pulse width encoded data stream into an analog signal [Col. 10, lines 24 – 25]

The examiner further explains, the limitation, “sampling the feedback signal within the digitizing device to create a plurality of signal samples within one PWM cycle”, is still not clearly pointing out the sampling device, which has been used to “sample signals”, which hereinafter has been interpreted to be a filter as taught by **Melanson**, “finite impulse response filter filtering the pulse width encoded data stream at a frequency greater than or equal to the second frequency“ [Col. 10, lines 17 – 31].

It would have been obvious to a person of ordinary skill in the art at the time of applicant’s invention to modify the teaching of **McCormick** to include the teach of **Takano**, “averaging, calculating the samples”, for the purpose of detecting a reduction in the accurately with which the welding current is detected, . . ., controlling the welding current with a predetermined degree of accuracy even when a reduction is detected [**Takano**, Col. 2, Lines 57 –

63], and also for the purpose of converting the pulse width encoded data stream into an analog signal [**Melanson**, Col. 10, lines 24 – 25]

Regarding dependent claims 2 – 4, McCormick teaches,

- The digitizing device is an A/D converter, a DSP or a micro controller. [microprocessor & ADC, Col. 7, Lines 12 – 39 & 47 – 61, Fig. 8]

Regarding dependent claims 7,

McCormick teaches,

- The accumulatoe resets when the algorithm sends the pulse width signal to the coil of the electrohydraulic valve. [can be accordingly adjusted approximately once every 1 ms, Col. 7, Lines 58 – 60]

Melanson teaches,

- such that the method of driving the coil of an electrohydraulic valve with a pulse width modulator drive starts over again for a next pulse width modulator cycle.

3. **Claims 5 and 6 are rejected** under 35 U.S.C. 103(a) as being unpatentable over McCormick, and in view of Gary Bergstrom (U.S. Patent No. 6,249,418, and referred to as **Bergstrom** hereinafter).

(**McCormick** as set forth above generally discloses the basic inventions.)

Regarding dependent claims 5 and 6,

McCormick teaches algorithms [formula relationships or look up data tables, Col. 7, Lines 47 – 61].

McCormick does not teach PID or PI.

Bergstrom teaches PID [standard closed loop controller design methods ... PID, Col. 9, Lines 63 – 65], for the purpose of generating the required force. [Col. 9, Lines 66 – 67]

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of **McCormick** to include the teach of **Bergstrom**, "PID", for the purpose of generating the required force. [Col. 9, Lines 66 – 67]

Response to Amendment

Claim Rejections - 35 USC § 103

4. Applicants argue the combination of **McCormick**, **Takano** and **Melanson** fails to teach, "sampling multiple samples within one PWM cycle", which is disagreed with. The term, "sampling", has been taught by **McCormick** and **Melanson** further teaches, "generating a pulse width encoded data stream at a second frequency of a selected multiple of the first frequency" which can be used to combine with **McCormick** to "sampling multiple samples within one PWM cycle".

Conclusion

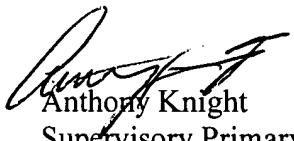
5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sunray Chang who may be reached Monday through Friday, between 8:00 a.m. and 5:00 p.m. EST. via telephone number (571) 272-3682 or facsimile transmission (571) 273-3682 or email sunray.chang@uspto.gov.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on (571) 272-3687.

The official facsimile transmission number for the organization where this application or proceeding is assigned is (571) 273-8300.



Anthony Knight
Supervisory Primary Examiner
Group Art Unit 2121
Technology Center 2100
U.S. Patent and Trademark Office

March 20, 2007